**3GPP TSG-RAN2 Meeting #109-e-Bis *R2-200xxxx***

**Online, 20th Apr 2020 - 30th Apr 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **36.321** | **CR** | **1469** | **rev** | **-** | **Current version:** | **15.8.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

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| ***Title:***  | Clarification for SR with HARQ-ACK-option 1 |
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| ***Source to WG:*** | ZTE Corporation, Sanechips, MediaTek Inc  |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NB\_IOTenh2-Core |  | ***Date:*** | 2020-04-09 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-15 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | According to the MAC spec, when only SR with HARQ-ACK is configured, if there has no HARQ-ACK in a certain TTI, UE will immediately initiate legacy RA procedure and cancel all pending SR. However, it may be also highly possible there are no available NPRACH resource on this TTI, e.g., UE may still need to wait for some time period for the next available radio frame / subframe containing NPRACH resource. How long of this time period is related to the NPRACH resource period configuration (which has minimum value of 40ms and maximum value of 2540ms). Purely based on the spec text, it’s not crystal clear whether the UE would or would not “immediately” cancel the pending SRs when it initiates the RA. If UE would not cancel the SR immediately, the UE may continuously check the following TTIs and it's still possible for the UE to use piggybacked SR before the TTI on which there has an available PRACH resource. On the other hand, if UE would cancel the SR immediately, even there may have a HARQ-ACK in the following TTIs after the UE initiates RA but before an available NPRACH resource occurs, this HARQ-ACK cannot be used. With such process, the possibility of using piggybacked SR is reduced. |
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| ***Summary of change:*** | To add clarification that the pending SR is cancelled only when random access preamble is transmitted and also add clarification that the RA procedure would be cancelled if RA has been initiated and SR is then sent piggy-backed on HARQ-ACK.**Impact Analysis**Impacted functionality:The changes only impact the trigger for random access procedure or dedicated SR with HARQ-ACK when there has pending SRs.Inter-operability:This is a clarification for purely UE process. No inter-operability issue is identified. |
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| ***Consequences if not approved:*** | MAC spec has ambiguity on whether the UE would or would not “immediately” cancel the pending SRs when it initiates the RA. |
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| ***Clauses affected:*** | 5.4.4 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**<Start of the first change>**

### 5.4.4 Scheduling Request

The Scheduling Request (SR) is used for requesting UL-SCH resources for new transmission.

When an SR is triggered, it shall be considered as pending until it is cancelled. All pending SR(s) shall be cancelled and *sr-ProhibitTimer* and *ssr-ProhibitTimer* shall be stopped when a MAC PDU is assembled and this PDU includes a BSR which contains buffer status up to (and including) the last event that triggered a BSR (see clause 5.4.5), or, if all pending SR(s) are triggered by Sidelink BSR, when a MAC PDU is assembled and this PDU includes a Sidelink BSR which contains buffer status up to (and including) the last event that triggered a Sidelink BSR (see clause 5.14.1.4), or, if all pending SR(s) are triggered by Sidelink BSR, when upper layers configure autonomous resource selection, or when the UL grant(s) can accommodate all pending data available for transmission.

If the MAC entity has resources for SR configured on only one of SPUCCH and PUCCH, that SR resource is valid for all logical channels. If the MAC entity has resources for SR configured on both PUCCH and SPUCCH, MAC entity shall consider all logical channels that have triggered an SR (and at *retxBSR-Timer* expiry, MAC entity shall consider all logical channels, belonging to a LCG, with data available for transmission):

- PUCCH resources for SR are valid if *logicalChannelSr-Restriction* is not configured, or if *logicalChannelSr-Restriction* allows SR on PUCCH, for any of the logical channels;

- SPUCCH resources for SR are valid if *logicalChannelSr-Restriction* is not configured, or if *logicalChannelSr-Restriction* allows SR on SPUCCH, for any of the logical channels.

If an SR is triggered and there is no other SR pending, the MAC entity shall set the SR\_COUNTER and the SSR\_COUNTER to 0.

As long as one SR is pending, the MAC entity shall for each TTI:

- if no UL-SCH resources are available for a transmission in this TTI:

- Except for NB-IoT:

- if the MAC entity has no valid PUCCH nor valid SPUCCH resource for SR configured in any TTI:

- if the MAC entity is a MCG MAC entity and *rach-Skip* is not configured; or

- if the MAC entity is a SCG MAC entity and *rach-SkipSCG* is not configured:

- initiate a Random Access procedure (see clause 5.1) on the corresponding SpCell and cancel all pending SRs;

- else if this TTI is not part of a measurement gap or Sidelink Discovery Gap for Transmission, and if transmission of V2X sidelink communication is not prioritized in this TTI as described in clause 5.14.1.2.2:

- if the MAC entity has at least one valid SPUCCH resource for SR configured for this TTI and if *ssr-ProhibitTimer* is not running:

- if SSR\_COUNTER < *dssr-TransMax*:

- increment SSR\_COUNTER by 1;

- instruct the physical layer to signal the SR on one valid SPUCCH resource for SR;

- start the *ssr-ProhibitTimer*.

- else:

- notify RRC to release SPUCCH for all serving cells;

- if the MAC entity has no valid PUCCH resource for SR configured in any TTI:

- notify RRC to release PUCCH for all serving cells;

- notify RRC to release SRS for all serving cells;

- clear any configured downlink assignments and uplink grants;

- initiate a Random Access procedure (see clause 5.1) on the SpCell and cancel all pending SRs.

- if the MAC entity has at least one valid PUCCH resource for SR configured for this TTI and if *sr-ProhibitTimer* is not running:

- if SR\_COUNTER < *dsr-TransMax*:

- increment SR\_COUNTER by 1;

- instruct the physical layer to signal the SR on one valid PUCCH resource for SR;

- start the *sr-ProhibitTimer*.

- else:

- notify RRC to release PUCCH and SPUCCH for all serving cells;

- notify RRC to release SRS for all serving cells;

- clear any configured downlink assignments and uplink grants;

- initiate a Random Access procedure (see clause 5.1) on the SpCell and cancel all pending SRs.

- For NB-IoT:

- if the MAC entity has no valid resource for SR together with acknowledgement of the data in this TTI and no valid PRACH resource for SR configured in any TTI:

- initiate a Random Access Procedure (see clause 5.1), and cancel all pending SRs when the random access preamble is transmitted.

- else:

- if the MAC entity has valid resource for SR together with acknowledgement of the data in this TTI:

- instruct the physical layer to signal the SR together with acknowledgement of the data.

- If Random Access Procedure was initiated for SR then cancel the Random Access Procedure.

- else:

- if the MAC entity has valid PRACH resource for SR configured in this TTI and *sr-ProhibitTimer* is not running:

- instruct the physical layer to signal the SR on one valid PRACH resource for SR.

- start the *sr-ProhibitTimer* in the subframe containing the last repetition of the corresponding SR transmission.

NOTE 1: The selection of which valid PUCCH/SPUCCH resource for SR to signal SR on when the MAC entity has more than one valid PUCCH/SPUCCH resource for SR in one TTI or overlapping TTIs is left to UE implementation.

NOTE 2: SR\_COUNTER is incremented for each SR bundle. *sr-ProhibitTimer* is started in the first TTI of an SR bundle.

**<End of the first change>**